

PATENT

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MS158346.01/MSFTP184USCERTIFICATE OF FACSIMILE TRANSMISSION

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Himanshu S. Amin

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:

Applicant(s): David E. Heckerman, *et al.*

Examiner: Wilbert L. Starks

Serial No: 09/873,719

Art Unit: 2129

Filing Date: June 4, 2001

Title: EFFICIENT DETERMINATION OF SAMPLE SIZE TO FACILITATE  
BUILDING A STATISTICAL MODEL

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REPLY BRIEF

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Dear Sir:

Appellants' representative submits this Reply Brief in response to the Examiner's Answer mailed December 5, 2005. A Request for Oral Hearing is being submitted concurrently herewith. Further, a credit card payment form is filed concurrently herewith in connection with all fees due regarding this document and the Request for Oral Hearing. In the event any additional fees may be due and/or are not covered by the credit card, the Commissioner is authorized to charge such fees to Deposit Account No. 50-1063 [MSFTP184US].

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**A. Regarding the Rejection of Claims 1-64 Under 35 U.S.C. §101**

Claims 1-64 stand rejected under 35 U.S.C. §101 as it is alleged that the subject claims are directed to non-statutory subject matter. This rejection should be reversed for at least the following reasons. The subject claims produce a useful, concrete and tangible result, and moreover, the subject claims relate to the utilization of software code to produce the useful, concrete and tangible result.

Independent claims 1, 19, 30, 42, 44, 53, 54, 62, 63 and 64 produce a useful, concrete and tangible result. Independent claim 1 (and similarly independent claims 19, 30, 42, 44, 53, 54, and 62-64) recites: *a computer implemented system that facilitates building a statistical model for a computer readable data set, comprising: a first training algorithm that efficiently builds a rough model from a subset of the computer readable data set; an evaluation component that determines whether the subset of the computer readable data set is an appropriate subset to build a model for the computer readable data set; and a second training algorithm that builds a refined model for the computer readable data set from the subset if deemed appropriate by the evaluation component.*

Appellants' claimed invention yields a number of useful, concrete and tangible results. Specifically, building a refined model for a computer readable data set based on an appropriate subset from the computer readable data set; determining whether the subset of the computer readable data set selected is appropriate to build the refined model; and building a rough model from a subset of a computer readable data set. All the aforementioned results are useful, concrete and tangible.

In the Examiner's Answer the Examiner appears to be under the misapprehension that 35 U.S.C. §101 requires the claims to contain limitations to practical applications in the technological arts. Appellants' representative disagrees. United States patent law has never supported the application of a "technological aspect" or "technological arts" requirement. Title 35 of the United States Code does not recite, explicitly or implicitly, that inventions must be within the "technological arts" to be patentable. Section 101 of Title 35 recites "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore ..." Accordingly, while an invention must be "new" and

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“useful,” there is no statutory requirement that it fit within a category of “technological arts.” Moreover, while there has been some judicial discussion of the expression “technological arts” and its relationship to patentability, this dialogue has been limited and its viability questioned. In 1970, the Court in *In re Musgrave*, 431 F.2d 882, 167 USPQ 280 (CCPA 1970) introduced a standard for evaluating process claims under Section 101: any sequence of operational steps is a patentable process so long as it is within the technological arts so as to promote the progress of useful arts. While a few subsequent courts have made reference to this so-called “technological arts” standard, the Supreme Court in *Gottschalk v. Benson*, 409 U.S. 63, 175 USPQ 673 (1972) refused to adopt this standard when it reversed the Court of Customs and Patent Appeals decision in the aforementioned case. Moreover, the Court of Customs and Patent Appeals effectively rejected the technological arts test in *In re Toma*, 575 F.2d 872, 878, 197 USPQ 852, 857 (CCPA 1978), by strongly suggesting that *Musgrave* was never intended to create a technological arts test for patent eligibility:

The language which the examiner has quoted [from *Musgrave* and its progeny relating to “technological arts”] was written in answer to “mental steps” rejections and was not intended to create a generalized definition of statutory subject matter. Moreover, it was not intended to form a basis for a new § 101 rejection as the examiner apparently suggests. *In re Toma*, 575 F.2d at 878, 197 USPQ at 857.

Moreover, the “technological arts” consideration is completely devoid from recent Federal Circuit cases like *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, (Fed. Cir. 1999), and *State Street Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1373, 47 USPQ2d 1596, 1601 (Fed.Cir.1998).

It is submitted that the “technological arts” requirement propounded by *Musgrave* should be confined to its facts and holding, *i.e.*, that the computer-related invention in dispute was a patentable invention within the meaning of Section 101 because it was an advancement in technology which clearly promoted the useful arts. Thus, the decision in *Musgrave* should not be construed as a “technological arts” requirement for patentability, but rather as a proposition that computer-implemented process claims might be patentable

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subject matter.

Further, in *Ex parte Lundgren*, Appeal No. 2003-2088, Application 08/093,516, (Precedential BPAI opinion September 2005), the Board rejected the Examiner's argument that *Musgrave* and *Toma* created a technological arts test. "We do not believe the court could have been any clearer in rejecting the theory the present examiner now advances in this case." *Lundgren*, at 8. The Board held that "there is currently no judicially recognized separate 'technological arts' test to determine patent eligible subject matter under § 101." *Lundgren*, at 9. Thus, in view of the foregoing it is evident that there are no recognized exceptions to eligible subject matter other than laws of nature, natural phenomena, and abstract ideas.

Moreover, in the Examiner's Answer the Examiner notes that claims are defined by their limitations, while appellants' representative is not in disagreement with such a statement, it is nevertheless submitted that the Examiner erroneously categorizes the subject claims as reciting a purely mathematical algorithm, and thusly attempts to deprecate appellants' claimed invention based on this erroneous categorization. As stated *supra*, the subject claims recite useful, concrete and tangible results, viz. building a rough statistical model, determining whether a subset of a computer readable data set is an appropriate subset to build a model, and building a refined statistical model. The fact that the subject claims utilize various algorithms and formulae to render a result are neither germane nor relevant to the determination of whether the result itself is useful concrete and tangible. According to *AT&T Corp. v. Excel Communications, Inc.* all that is required is that a "mathematical concept has been *reduced to some practical application rendering it 'useful.'*" *AT&T* at 1357 citing *In re Alappat*, 33 F.3d 1526, 1544, 31 USPQ2d (BNA) 1545, 1557 (Fed. Cir. 1994) (emphasis added).

In addition, the Examiner notes that the term "subset" is a purely mathematical construct from set theory, and that all the other elements cited in applicant's argument (e.g., "model") are pure mathematical constructs incapable of patent protection. (See Examiner's Answer, pages 13-14). While appellants' representative does not entirely disagree with the Examiner's indication that the terms "subset", "model", *etc.* find application within the realm of mathematics, the fact remains that the terms utilized in the

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subject claims find common usage in colloquial language and are not solely restricted to the esoteric ambit of mathematics. Consequently, one of ordinary skill on reading the subject claims would perceive the extent and practical application set forth in the claims.

Furthermore, the Examiner states "Applicant makes a purely conclusory statement that pure "software code" may be construed somehow to be a "process" in the constitutional, patent sense." (See Examiner's Answer, page 18). Appellants' representative notes in response, that the statement regarding the fact that software code alone qualifies as an invention eligible for patenting, at least as a process, is a direct quote from the recent Court of Appeals for the Federal Circuit case *Eolas Techs., Inc. v. Microsoft Corp.*, 399 F.3d 132 (Fed. Cir. 2005) that states:

Title 35, section 101, explains that an invention includes "any new and useful process, machine, manufacture or composition of matter." ... Without question, *software code alone qualifies as an invention eligible for patenting under these categories*, at least as processes. *Id.* at 1338 (emphasis added).

Thus, the attribution of the statement to appellants' representative is clearly in error.

Further, the Examiner citing *Diamond v. Diehr*, 450 U.S. 175, 209 USPQ 1 (1980), states that a process requires that certain things be done with certain substances in a certain order, and that pure "software code" provides no such transformation of "substance" at all. (See Examiner's Answer, pages 18-19). Appellants' representative disagrees with such statements. Although it is true that a process must perform certain acts in order to elicit a useful, concrete and tangible result, the court in *Eolas*, in rendering its recent decision, did not apparently perceive that a transformation of a substance was a necessary requirement to satisfy the criteria for patentability under 35 U.S.C. §101. To the contrary, the court in *Eolas* simply stated "Title 35, section 101, explains that an invention includes 'any new and useful process, machine, manufacture or composition of matter' ", and that "software code alone qualifies as an invention eligible for patenting under these categories, at least as processes." *Eolas* at 1338.

Moreover, the Examiner's statement that the Federal Circuit in *State Street* could have simply based its decision on the idea that the invention was "software" (see

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Examiner's Answer, page 19) does not represent the current reality that *Eolas*, being the most contemporaneous reflection of judicial reasoning on the issue of patentability under 35 U.S.C. §101, has clarified and extended the ambit of *State Street* to be inclusive of software *per se*. Thus, the Examiner's assertion in this respect is clearly at odds with current Federal Circuit opinion on this matter.

Additionally, the Examiner contends that appellants' representative's statement that the subject claims pertain to software code comprising: a first training algorithm that efficiently builds a rough model from a subset of a computer readable data set, an evaluation component that determines whether the subset of the computer readable data set is an appropriate subset to build a mode for the computer readable data set, and a second training algorithm that builds a refined model for the computer readable data set from the subset if deemed appropriate by the evaluation component, is conclusory and has been mooted by the Examiner's previous arguments. Appellants' representative avers to the contrary. As has been stated above, it is appellants' belief that under current Federal Circuit opinion, as elucidated by *AT&T* and *State Street*, the sole determinant for patentability under 35 U.S.C. §101 is that the subject claims elicit a useful, concrete and tangible result. Moreover, it is appellants' representative's further belief, in light of the recent Federal Circuit decision in *Eolas*, that software code without more constitutes patentable subject matter. Thus, on the basis of *AT&T*, *State Street*, and *Eolas*, the fact that appellants' representative has not only demonstrated that the subject claims produce a useful, concrete and tangible result, but also that the recited claims relate to software code, leads one to the exorable conclusion that the rejected claims fall squarely within the purview of 35 U.S.C. §101, and that the Examiner's rejection of the instant claims is in error. Accordingly, reversal of this rejection is requested.

**B. Regarding the Rejection of Claims 1-64 Under 35 U.S.C. §112**

Claims 1-64 stand rejected under 35 U.S.C. §112, first paragraph, because it is alleged that current case law and the MPEP require such rejection for claims that stand rejected under 35 U.S.C. §101. It is believed that this rejection is improper and should be reversed for at least the following reasons. The rejection of the subject claims under 35

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U.S.C. §112, first paragraph is merely a *pro forma* rejection, and furthermore the rejection of claims 1-64 under 35 U.S.C. §101 should be reversed pursuant to the aforementioned comments rendering the subject rejection under moot. Accordingly, reversal of this rejection is requested.

**C. Regarding the Rejection of Claims 1, 19, 30, 42 and 64 Under 35 U.S.C. §102(b)**

Claims 1, 19, 30, 42 and 64 stand rejected under 35 U.S.C. §102(b) as being anticipated by Guha *et al.* (US 5,140,530). This rejection should be reversed for at least the following reasons. Guha *et al.* fails to disclose or suggest each and every feature set forth in the subject claims.

Appellants' claimed invention relates to systems and methods that facilitate building a model to characterize data based on an appropriately sized subset of the computer readable data set. In particular, independent claims 1, 19, 30, 42 and 64 recite similar aspects, namely: an evaluation component that determines whether the subset of the computer readable data set is an appropriate subset to build a model for the computer readable data set and a second training algorithm that builds a refined model for the computer readable data set from the subset if deemed appropriate. Guha *et al.* does not disclose or suggest such aspects of the invention as claimed.

The Examiner in the Examiner's Answer, in reference to the Appellants' representatives assertion that Guha *et al.* is silent regarding the blueprint being a subset from a data set which is to be modified, conjectures "Just how big can the so-called 'subset' really be anyway?" and asserts that appellant "admitted in his argument that the claimed 'subset' can include the entire set." (See Examiner's Answer, page 22). While appellants' representative does not deny that a subset could be inclusive of the set in its entirety, a subset can equally comprise a null or empty set, the reality, as would be reasonably understood by persons ordinarily skilled in the art, however lies not at the extremes, but rather, between the extremes.

Nevertheless, despite this conjectural aside into what constitutes a "subset", the point that appellants' representative was, and is, attempting to put forth is that Guha *et al.*

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does not disclose the fact that the *subset*, albeit blueprints, is not *from a data set which is to be modeled*. Appellants' claims in contrast relate to employing a subset from a data set to build a model that represents the data set; hence, a portion of the data set can be utilized in connection with modeling the data set. Thus, Guha *et al.* does not anticipate or suggest such claimed aspects.

Moreover, contrary to the Examiner's assertions in the Examiner's Answer, Guha *et al.* also fails to disclose or suggest an evaluation component that determines whether the subset of the computer readable data set is an appropriate subset to build a model for the computer readable data set, and a second training algorithm that builds a refined model for the computer readable data set from the subset if deemed appropriate by the evaluation component.

In relation to the evaluation component aspect recited in the subject claims, Guha *et al.* discloses that the fitness of a network can be determined by an evaluation function. (See col. 3, lines 59-61). Appellants' claimed invention in contrast utilizes an evaluation component to determine whether a subset of the computer readable data set is an appropriate subset to build a model for the computer readable data set. It is submitted that this is a patentable distinction sufficient to overcome the cited document.

In addition, in relation to the utilization of a second training algorithm recited in the subject claims, Guha *et al.* updates blueprints in a cyclical manner such that an untrained network is trained, and then the trained network is evaluated to determine blueprint fitness. In contrast, the invention as claimed utilizes a second training algorithm in order to build a refined model for the computer readable data set from the subset if deemed appropriate. It is submitted that this forms another patentable distinction sufficient to overcome the cited document and the instant rejection under 35 U.S.C. §102(b).

In connection with appellants' representative's belief that the Examiner has failed to fully satisfy the burden imposed under MPEP §707.07(i) and 2105. Appellants' representative appreciates the Examiner's offer to undertake a further search in order to reject individual dependent claims. However, it was merely appellants' representative's intent to indicate that should the arguments set forth in the Appeal Brief overcome the §§



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101 and 112 rejections, it will be presumed that all the dependent claims will be in condition for allowance.

CONCLUSION

For at least the above reasons, the claims currently under consideration are believed to be patentable over the cited references. Accordingly, it is respectfully requested that the rejections of claims 1-64 be reversed.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [MSFTP184US].

Respectfully submitted,  
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